

MAT BLACK

Work Order ID 72018

Monday, July 18, 2011 8:49:04 AM



Item ID: D212-664-201MB

Accept



Setup Start



Revision ID: ~~11-64~~

Item Name: Crosstube Aft

Stop



Start Date: 7/18/2011 Start Qty: 1.00

Required Date: 8/10/2011 Req'd Qty: 1.00



Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

OK

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID Tool # Plan Code Accept Qty Reject Qty Reject Number Insp. Stamp

Draw Nbr

Revision Nbr

D212-664-241

Rev D *11-64*

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D212-664-201

CH004

OK for BG 11/08/12

8/10/12

110

0.00



Pick Kit

Packaging

Packaging

Memo

0.00

Packaging

DP

11-7-27

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-241 using CNC bender program 212-aft

DP

11-7-27

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

Work Order ID 72018

Monday, July 18, 2011 8:49:04 AM

Page 2

Item ID: D212-664-201MB

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Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

0 11-07-27

140

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550, DT8551, drill table DT8577 and locate tower holes #8 as per QSI0010.

2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241

TW
SAD 11-07-28

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 3

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Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
---------	--------	--------------	---------------	---------------	------------------	----------------

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat as within 24 hours of bending and drilling

TL
SAD 11-07-28

①

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

M 11 07 28 ①

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

M 11 07 28 ①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

Outsource process - NDT per QSI038 4.1

0.00



Outsource2

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038
Issue P/O: *14609*
LPI as per ASTM 1417 Level 2
Attach copy of NDT results to work order*11-08-2*

190

Receive & Inspect for Damage & Mat'l Certs
Packaging

0.00



Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

PW/20

200

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

Inspect for damage & ensure results are as per Dwg D212-664-241

85 11-07-29

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 5

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Required Date: 8/10/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID Tool # Plan Accept Reject Reject Insp.
Code Qty Qty Number Stamp

210

Spray Painting per QSI005 4.2
SprayPaint

0.00



SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2
B 117607

11/08/09

2-Paint outside crosstube as per DEO D212-667-241
Matt Black Imron - DUP47-1640-0.8GL
B 117699
per QSI 005 4.2

PRIME:

Start Time:

Fininsh Time:

11 08 09

PAINT:

Start Time:

Finish Time:

10:30
12:00

220

QC14- Inspect Spray Paint

0.00



QC

Quality Control

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

11 - 08 - 10

W/O:		WORK ORDER CHANGES					
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Monday, July 18, 2011 8:49:04 AM

Page 6

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Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

230

0.00



Crosstubes

Crosstubes

Memo

0.00

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs

A/R 6398 Magnobond

Batch:

178-234

Expiry Date:

11-11

3-Install clamps as per Dwg D212-664-241. Torque clamps to 80-100 in lb.

240

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

8 w/08/12

(40)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID 72018

Monday, July 18, 2011 8:49:04 AM

Page 7

Item ID: D212-664-201MB

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Item Name: Crosstube Aft

Setup Start

Stop

Start Date: 7/18/2011 Start Qty: 1.00

Required Date: 8/10/2011 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

250

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

11/8/12 \$

260

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

Sulaski

(20)

270

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-201

Rev H

11/8/12 \$

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Work Order ID 72018

Monday, July 18, 2011 8:49:04 AM



Page 8

Item ID: D212-664-201MB

Accept



Setup Start



Revision ID: U/R

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Stop



Start Date: 7/18/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 8/10/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/08/12

MF
11-08-12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

Monday, July 18, 2011 8:49:01 AM

Page 1

Work Order ID: 72018

Parent Item: D212-664-201MB

Parent Item Name: Crosstube Aft



Start Date: 7/18/2011

Required Date: 8/10/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E: 04.02.16 Reformat I/K/DS
 IPP Rev:F: 06-03-29 Remove Coments on Pick List JLM
 IPP Rev:G: 07-04-30 As per Rev C JLM
 IPP Rev:H: 08-05-22 up date Qty of rubber cushion DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
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D212-664-
201TRNRevC

Manufactured No

110

Each

0.0000

1

Crosstube Turning Detail

D3595-063-530

Manufactured No

230

Each

70.0000

2

RUBBER CUSHION

Location

Loc Qty

Loc Code

LG

56

70067

56

LG055

14

63407

6

67185

8

D2940-1

Manufactured No

230

Each

15.0000

2

Support

Location

Loc Qty

Loc Code

LG

15

70737

15

B72384



①

11-7-26



24

11-08-11



11-08-11

xy

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Monday, July 18, 2011 8:49:01 AM

Work Order ID: 72018

Parent Item: D212-664-201MB

Parent Item Name: Crosstube Aft

Page 2

3

MS21920-24 -30 111258



Clamp(per MIL-DTL-8783C)

Purchased

No

230

Each

39.0000

4

4

Start Date: 7/18/2011

Required Date: 8/10/2011

Start Qty: 1.00

Required Qty: 1.00



BT 11-08-11

Location

Loc Qty

Loc Code

FG

5

105884

5

LG050

34

116839

2

117998

32

D3428-1

Manufactured

No

250

Each

18.0000

1



Placard



sl

Location

Loc Qty

Loc Code

ST053

18

68920

8

71168

10

MS21042L6

Purchased

No

250

Each

317.0000

6

6



Nut



sl

Location

Loc Qty

Loc Code

ST300

317

117343

17

117677

200

118078

100

AN960JD616

NAS1149D066JJ

Purchased

No

250

Each

0.0000

18

18



Washer



M118378 11/8/12

Monday, July 18, 2011 8:49:01 AM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

Monday, July 18, 2011 8:49:01 AM

Work Order ID: 72018

Parent Item: D212-664-201MB

Parent Item Name: Crosstube Aft

Page 3

13

AN6-40A



Bolt

Purchased

No

250

Each

80.0000

4

Start Date: 7/18/2011

Start Qty: 1.00

Required Date: 8/10/2011

Required Qty: 1.00



4

Location

Loc Qty

Loc Code

ST340

30

117366

30

ST343

50

117688

50

AN6-41A



Bolt

Purchased

No

250

Each

50.0000

2



2
11/8/12

Location

Loc Qty

Loc Code

ST344

50

117366

40

118191

10

2

Monday, July 18, 2011 8:49:01 AM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

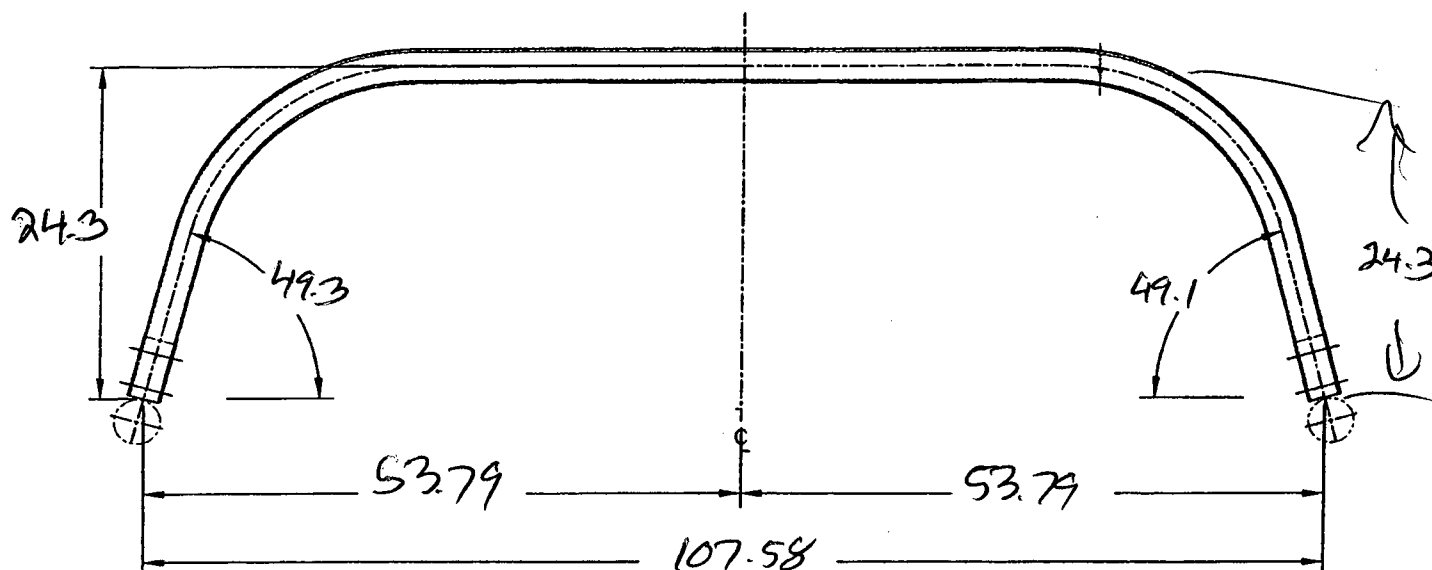
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DART AEROSPACE LTD		Work Order:	72018
Description: Crosstube High Aft (205/212)		Part Number:	D212-664-201
Inspection Dwg: D212-664-241 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	24.17	24.43
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70



Pages	15	Comments

QC15 Inspection Date	11.07.27
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Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. C	KJ/JLM	
C	10.04.01	Dwg Rev updated	KJ	

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NOTE: Date & initial all entries

D212-664-20MB 77018 ECU 11-614

D

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

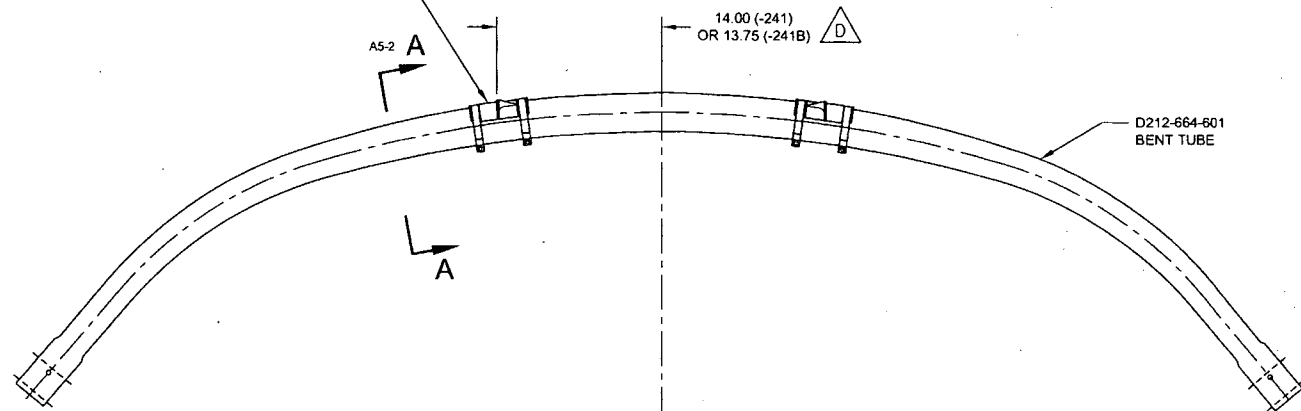
- MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.362±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS.
- WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING
IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE
OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS
AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE
SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND
MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT
HAS NOT BOTTOMED-OUT AFTER TORQUING.

ECU #11-614
11.09.25
UNDER REVIEW
11.09.13
DEO ATTACHED
RELEASED
2009-10-29

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-241	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	CROSSTUBE ASSY (205/212 HI AFT)	NTS
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8 7 6 5 4 3 2 1

12 13 15
 D2940-1 SUPPORT
 MS21920-28 CLAMP, 2X
 D3595-063-530 RUBBER CUSHION, 2X
 2 PL

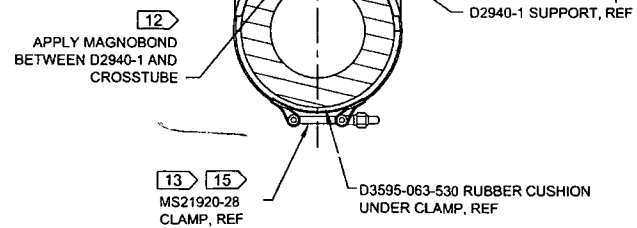


D212-664-241/-241B
ASSEMBLY DETAIL

ECO#11-614
 11.07.26
UNDER REVIEW
 06.13

DEO ATTACHED

RELEASED
 2009 -10- 28

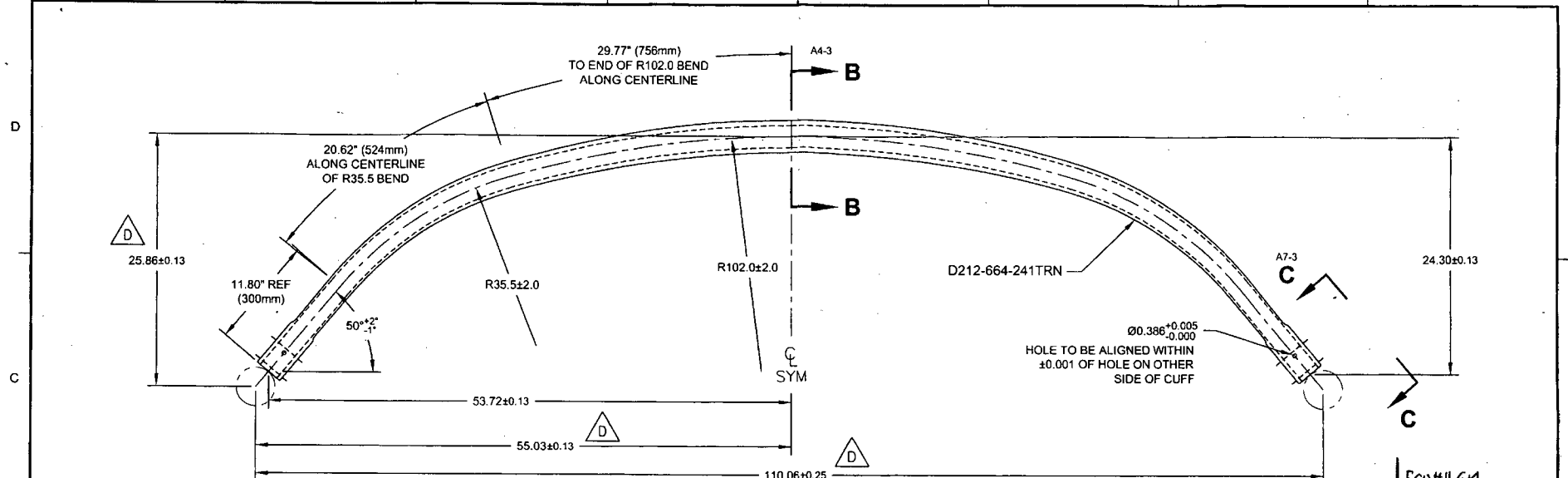


SECTION A-A D6-2
 SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9P	DRAWING NO.	REV. D
MFG. APPR.	13	D212-664-241	SHEET 2 OF 4
APPROVED	14	TITLE	SCALE
DE APPR.	14	CROSSTUBE ASSY (205/212 HI AFT)	NTS
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8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1



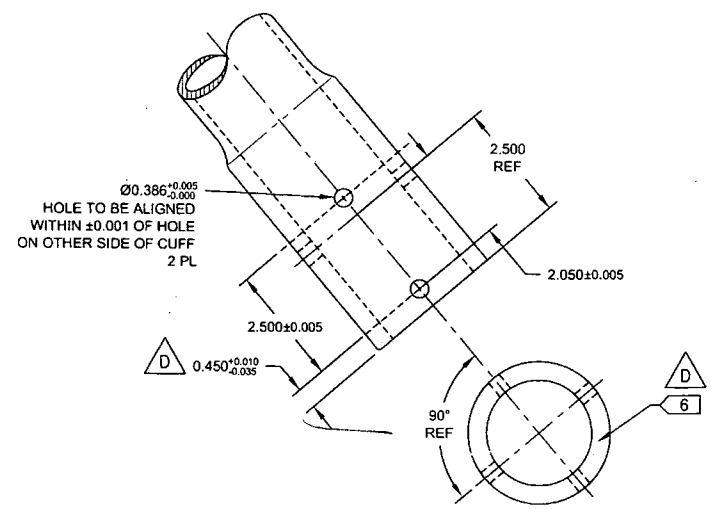
D212-664-601 10 D
BENDING AND DRILLING DETAIL

ECW #11-614
 11.07.26

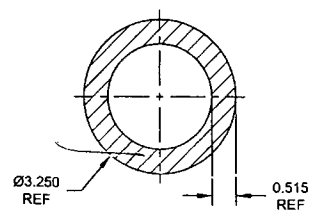
UNDER REVIEW
9/11/06/13

DEO ATTACHED

RELEASED
 2009-10-29
md



VIEW C-C: CUFF DETAIL D2-3
 SCALE 3X



SECTION B-B D4-3
 SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	Q	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-241	SHEET 3 OF 4
APPROVED	AP	TITLE	SCALE
DE APPR.	HL	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
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8 7 6 5 4 3 2 1

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

SEE DETAIL D

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

0.515 WALL
STOCK, REF

62.181 REF

3.250
STOCK, REF

SYM

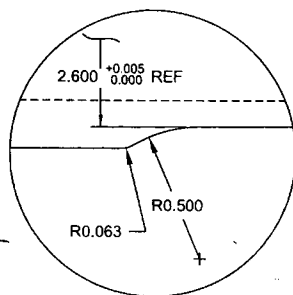
SEE DETAIL E

A4-4

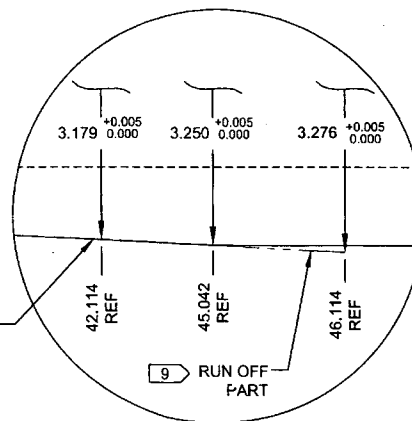
TAPER UNIFORMLY FROM
THROUGH TO 3.276
RUNNING OFF PART

9 3.179

D212-664-241TRN
TURNING DETAIL



DETAIL F:
CUFF TRANSITION
SCALE 10X C2-4



DETAIL E:
TAPER RUN-OFF
NOT TO SCALE C5-4

9 30° X 0.500 DEEP
CHAMFER

0.200

R0.063

SEE DETAIL F

A7-4

DETAIL D:
CROSSTUBE CUFF
SCALE 5X D8-4

UNDER REVIEW

9/10/13

DEO ATTACHED

RELEASED

2009-10-29

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	90	DRAWING NO.	REV. D
MFG. APPR.	AS	D212-664-241	SHEET 4 OF 4
APPROVED	AD	TITLE	SCALE
DE APPR.	TH	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD	
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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

UNDER REVIEW

11.06.13
RCW-614
11.07.28

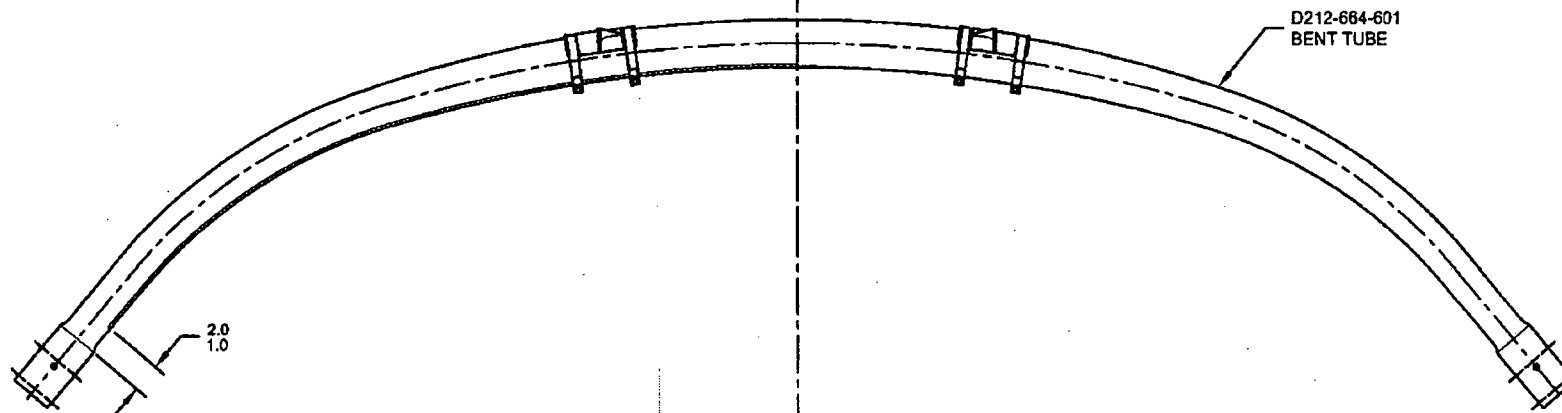
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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>UP</i>	MFG. APPR. <i>E</i>	APPROVED <i>MD</i>	DE APPR. <i>MD</i>			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

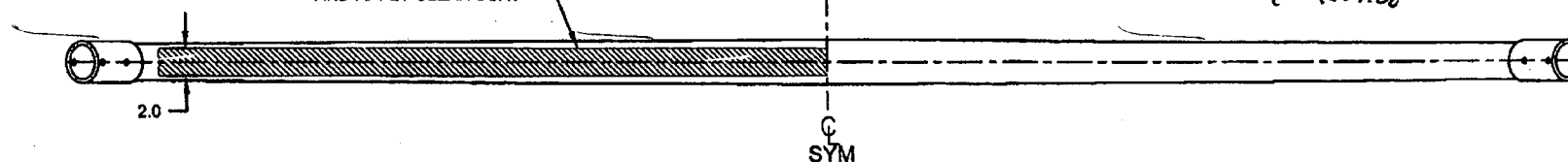
IS:

WAS:



**D212-664-241/-241B
ASSEMBLY DETAIL**

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT



RELEASED
2011-04-18

UNDER REVIEW

UP 11.06.13
11.06.13
11.07.12

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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASS'Y (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>Q</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>Q</i>	APPROVED <i>MP</i>		DE APPR. <i>MP</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11.07.21		DATE 11.07.21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -241	Qty -241B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

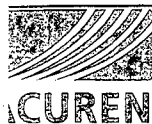
IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QS-045. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
W



LIQUID PENETRANT TEST REPORT

P-05625

CLIENT: DART AEROSPACE DATE: July 29/2011 PAGE 1 OF 1
ATTENTION: LYNDA/CHARITALE/IAN ACUREN JOB NO. 133-11-02163 TIME AM ☒ PM ☐
ADDRESS: 1270 ABERDEEN RD PO/NO. 14609 WORK LOCATION: AS ADDRESS
HILKETBURN ON ACCEPTANCE STD. ASIN 1413/051033 REV./DATE 2005
PROJECT: PT WET FLUORESCENT ON 9 CROSSTUBES & 4 RAPPELS
ITEM(S) EXAMINED:

OBJ DESCRIPTION: PROCEDURE NO. LT-002 REV./DATE 2003 TECHNIQUE NO. LT-002 REV./DATE 2003
ART NO. MATERIAL: ALUMINUM THICKNESS: N/A
SCOPE: PERFORMED A WET FLUORESCENT LIQUID PENETRANT INSPECTION ON 100% OF THE EXTERNAL SURFACE ON ITEMS MENTIONED BELOW

TEST DETAILS
METHOD: ☒ FLUORESCENT ☐ VISIBLE ☐ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND: MAGNAFLUX BLACK LIGHT S/N: 13788 ☐ OUTPUT > 1000 μ W/cm² ☒ AMBIENT < 2 fc
PENETRANT: ZL-67 MINIMUM DWELL TIME: 10 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER: H₂O MINIMUM DRY TIME: >10 MIN. OTHER:
DEVELOPER: SKD-53 MINIMUM DWELL TIME: 10 MIN. LIGHT METER S/N: CAL DUE DATE: 11/05/2011
DEVELOPER TYPE: ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE
SURFACE CONDITION: ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE: ☐ < -4°C/20°F ☐ -4°C/20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

ITEM	DESCRIPTION	W.O. ID	ITEM ID	DATE
1	CROSSTUBE	6957	D407-667-205	AFT
2	"	72017	D012-664-101MB	FWD
3	"	72054	D012-664-101	FWD
4	"	71825	D407-667-205	AFT
5	"	71824	D407-667-205	AFT
6	"	72260	D012-664-101	FWD
7	"	71437	D012-664-201	AFT
8	"	72013	D012-664-201MB	AFT
9	"	71438	D012-664-201	AFT
10	RAPPEL	6962	ITEM ID D3011-1	

NO RELEVANT INDICATION WAS DETECTED
AS PER APPLICABLE STANDARDS

ITEM ID D3011-1
11 07-29

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES
CLIENT REPRESENTATIVE: IAN TITLEY SIGNATURE: [Signature] DTR # 244712
TECHNICIAN (SIGNATURE): [Signature] REPORT REVIEWED BY:
NAME (PRINT): IVES DESROSIER NAME: INITIALS:
CGSB LEVEL: 2 SNT LEVEL: 2 CGSB LEVEL: SNT LEVEL:
CGSB REG. NO: 3049 CGSB REG. NO:

REFERENCE ONLY

5.0 PARTS LIST

5.1 HIGH GEAR CROSSTUBES

Item	-101	-201	-203	Part Number	Description
	X			D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
31			2	* D2856-600-1009	ABRASION STRIP
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
50	1	1		D3428-1	PLACARD

* REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE
NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA
SKIDTUBES.

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Revision: F
Date: 08.09.05